REMARKS

The following claims are pending in the application: 1 – 33

The following claims have been amended: 1 and 18

The following claims have been deleted: 15, 16, 31, and 32

The following claims have been added: Not applicable

As a result of the foregoing Amendment, the following claims remain pending in the application: 1 – 14, 17 – 30 and 33.

Amendment to the Specification

Per the Examiner's request, Applicant has amended paragraph [0001] to reflect that application serial number 10/376,865 has been allowed to issue as U.S. Patent No. 6,855,950.

The Rejection Under 35 U.S.C. §112, second paragraph

The Examiner rejects claims 1 – 33 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Examiner takes the position that the term "strong" in independent claims 1 and 18 is a relative term which renders the claims indefinite.

Applicant respectfully directs the Examiner's attention to paragraph [0016] of U.S. Patent No. 6,855,950, which is incorporated by reference into the present application. Paragraph [0016] defines "strong" as:

[0016] As used herein, the term "strongly coupled electronically" is used to indicate that the substrate(s) and monolayer share one or more common molecular

orbitals, and thus that electrons are delocalized over both the monolayer and the substrate. "Strongly coupled electronically" can also be interpreted as a chemical bond between the substrate and the monolayer which is stable enough to permit switching of the monolayer and the conductance of electricity across the bond. The term also refers, in the case of an organic moiety, to electronic coupling that is at a level greater than the aliphatic equivalent of the bond in question. A conjugated bond is one example of strong electronic coupling. As used throughout, the term "conjugated" shall mean conjugated in its typical and traditional capacity except for instances where a metal or silicon substrate are employed. For a metal or silicon substrate, the use of the term conjugated shall be interpreted to mean that the metal-carbon, metal-oxygen, silicon-carbon or silicon-oxygen bond between the substrate and the monolayer are strongly coupled electronically.

Accordingly, Applicant respectfully submits that one of ordinary skill would understand that "strongly coupled electronically" and "strong electronic coupling" are synonymous with one another. Therefore, Applicant submits that the Examiner's outstanding rejection may be properly withdrawn as the application discloses what "strong" means.

The Rejection Under 35 U.S.C. §102(b)

The Examiner rejects claims 1 – 6 and 9 – 17 under 35 U.S.C. §102(b) as being anticipated by Zhou et al. In so rejecting, the Examiner takes the position that Zhou teaches a molecular wire comprising a monolayer of parallel, biphenyl units covalently bonded to the surface of a gold electrode. The Examiner states that a layer of titanium and gold is formed over the monolayer to form a top electrode. The Examiner reasons that because the top electrode is exposed, at least some of the outer surface will inherently oxidize resulting in a top electrode that comprises both a metal and a metal oxide wherein the metal oxide is gold oxide and/or titanium oxide.

Applicant has amended claim 1 to more accurately claim the subject matter of the present invention. Applicant has additionally cancelled claims 15 and 16. Specifically,

claim 1 has been amended to reflect that the electronic junction of the present invention is a solid-state device devoid of electrolytic solution. Furthermore, claim 1 has been amended to reflect that the conductance of a layer of metal/metal oxide in the second conductive component reversibly changes in response to a reduction-oxidation reaction occurring in the layer when a voltage is applied across the electronic junction. (*See* paragraphs 0046 – 0056 for disclosure support and original claims 15 and 16) Applicant respectfully submits that the rejection of claims 1 – 6 and 9 - 17 over Zhou et al. may be properly withdrawn as Zhou fails to teach each and every element of claim 1, as presently amended, and those claims dependent therefrom (namely, 2 – 6, 9 – 14, and 17).

The Examiner rejects claims 1 – 7, 9 – 26 and 29 – 33 under 35 U.S.C. §102(e) as being anticipated by Gryko et al. (US Pat. No. 6,324,091). In so rejecting, the Examiner takes the position that Gryko teaches an apparatus for storing data comprising a storage medium having first and second subunits coupled to a working electrode (corresponding to substrate of first conductive component) and a reference electrode (corresponding to the second conductive component) (Fig. 1 and col. 3, ll. 53 – 60). The Examiner further takes the position that Gryko discloses that suitable subunits include various compounds having substituted and unsubstituted phenyl groups, such as porphyrinic macrocycles, metallocene, etc. (Col. 3, ll. 60 – col. 4, ll. 6). The Examiner additionally takes the position that Gryko discloses that the storage molecule is electrically coupled to the electrode by either a direct covalent link (i.e., R—X chemical bond) or direct or indirect ionic bonding (which is taken to read on "strong electronic coupling") (Col. 7, ll. 46 – 65). The Examiner further takes the position that Gryko discloses that the molecules self-assemble on the electrode substrate (e.g., a metal such as gold) to form an organized monolayer that may

be arranged in an upright orientation (Col. 23, ll. 40 – 57). The Examiner interprets this orientation to indicate that the molecules of the self-assembled layer will be substantially parallel to each other. The Examiner also takes the position that Gryko discloses that the electrodes may be formed of a metal such as gold, silver, or copper (Col. 52 – 58). The Examiner takes the position that because the electrodes are exposed, at least some of the outer surface will inherently oxidize resulting in electrodes that comprise both a metal and a metal oxide wherein the metal oxide is gold, silver, or copper oxide. Furthermore, the Examiner comments that an alternative embodiment shown in Figure 4 comprises a mirror image construct. In the alternative embodiment, the Examiner takes the position that one working electrode and storage medium reads on the first conductive component and the other working electrode and storage medium reads on the second conductive component.

Applicant has amended claim 1 to more accurately claim the subject matter of the present invention. Applicant has additionally cancelled claims 15 and 16. Specifically, claim 1 has been amended to reflect that the electronic junction of the present invention is a solid-state device devoid of electrolytic solution. Furthermore, claim 1 has been amended to reflect that the conductance of a layer of metal/metal oxide in the second conductive component reversibly changes in response to a reduction-oxidation reaction occurring in the layer when a voltage is applied across the electronic junction. (*See* paragraphs 0046 – 0056 for disclosure support and original claims 15 and 16) Applicant respectfully submits that the rejection of claims 1 – 7 and 9 - 17 over Gryko et al. may be properly withdrawn as Gryko fails to teach each and every element of claim 1, as

presently amended, and those claims dependent therefrom (namely, 2 – 7, 9 – 14, and 17).

Applicant has additionally amended claim 18 to reflect that the electronic junction is a solid-state device devoid of electrolytic solution. (See original claims 31 and 32 for disclosure support). Applicant submits that Gryko teaches and only teaches a molecular memory storage device comprising electrolytes. In fact, Gryko teaches that the electrolytes are critical to form an operative device unlike the present invention as provided in independent claim 18 and those claims dependent therefrom. Accordingly, in light of the amendment to claim 18 (and the cancellation of claims 31 and 32), Applicant respectfully submits that the Examiner's outstanding rejection as to claims 18 – 26, 29 – 30, and 33 may be properly withdrawn.

The Rejection Under 35 U.S.C. §103(a)

The Examiner rejects claims 7 and 8 under 35 U.S.C. §103(a) as being unpatentable over Zhou et al.

With regard to claim 7, the Examiner takes the position that Zhou teaches all of the limitations of claim 7 except for chemically bonding a carbon or oxygen atom of the molecular unit to a metal, silicon, or carbon unit of the substrate. The Examiner takes the position that Zhou teaches a chemical linkage of metal-S formed by the use thiol functionalized biphenyl. Despite this, the Examiner reasons that it would be obvious to one skilled in the art to use the analogous alcohol functionalized biphenyl (which would result in a metal-O chemical bond) since thiols and alcohols have a similar structure and are known to behave in an analogous manner.

Applicant has amended claim 1 from which claim 7 depends. In light of the amendment to claim 1, and the discussion regarding said amendment provided above, Applicant respectfully submits that the Examiner's outstanding rejection of claim 7 may be properly withdrawn as Zhou fails to teach or suggest each and every element of the present invention as currently claimed.

With regard to claim 8, the Examiner takes the position that Zhou teaches all of the limitations of claim 8, except for the use of electrically conductive carbon as the bottom electrode. Despite this, the Examiner takes the position that it would have been within the ability of one skilled in the art to select any known electrically conductive material, including electrically conductive carbon, for the bottom electrode since the function of the bottom electrode is to conduct electricity.

Applicant has amended claim 1 from which claim 8 depends. In light of the amendment to claim 1, and the discussion regarding said amendment provided above, Applicant respectfully submits that the Examiner's outstanding rejection of claim 8 may be properly withdrawn as Zhou fails to teach or suggest each and every element of the present invention as currently claimed.

The Examiner rejects claims 8, 27, and 28 under 35 U.S.C §103(a) as being unpatentable over Gryko et al. taking the position that Gryko teaches all of the limitations of claims 8, 27 and 28 except for the use of electrically conductive carbon as the working electrodes. The Examiner further takes the position that although Gryko discloses gold as the preferred material, it recognizes numerous other materials suitable for use as the electrode including other metals, metal alloys, organic conductors, nanostructures, crystals, etc. (col. 26, ll. 52 – 58). Thus concludes the Examiner, it would have been

within the ability of one skilled in the art to select any known electrically conductive material, including electrically conductive carbon, for the working electrode since the function of the working electrode is to conduct electricity.

Applicant has amended claims 1 from which claim 8 is dependent and has amended claim 18 from which claims 27 and 28 are dependent. In light of the amendments to claims 1 and 18, and the discussion regarding said amendments provided above, Applicant respectfully submits that the Examiner's outstanding rejection of claims 8, 27, and 28 may be properly withdrawn as Gryko fails to teach or suggest each and every element of the present invention as currently claimed.

Non-statutory Double Patenting Rejection

The Examiner provisionally rejects claims 1, 8, 10 – 12, and 18 on the grounds of non-statutory obviousness-type double patenting as being unpatentable over claims 1 – 7 and 16 – 18 of copending application no. 10/754,410.

Applicant acknowledges the Examiner's provisional rejection of claims 1, 8, 10 – 12 and 18 and will respond appropriately should said rejection mature into a non-provisional rejection.

The Examiner rejects claims 1 – 33 on the grounds of non-statutory obviousness-type double patenting as being unpatentable over claims 32 – 39, 52, 53, 62, 63, 65 – 67, 79, 84, 85, 87, 88, 100, 104, 105, 107 – 109, and 120 of U.S. Patent No. 6,855,950.

Applicant has amended independent claims 1 and 18 and respectfully submits that in light thereof, the Examiner's double-patenting rejection may be properly withdrawn.

CONCLUSION

In view of the foregoing amendment and accompanying remarks, the Applicants respectfully submit that the present application is properly in condition for allowance and may be passed to issuance upon payment of the appropriate fees.

Telephone inquiry to the undersigned in order to clarify or otherwise expedite prosecution of the subject application is respectfully encouraged.

Respectfully submitted,

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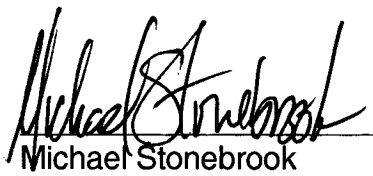
Date: March 30, 2006 By: 

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